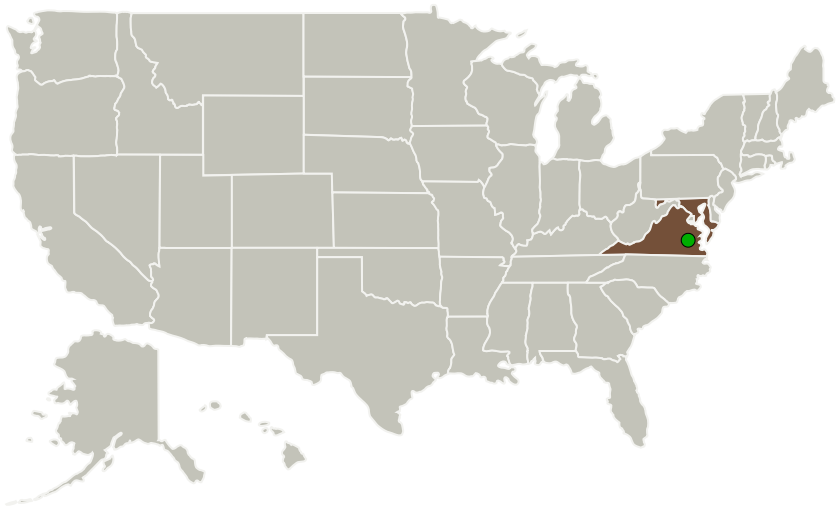
Lidar Wind Profiler for the NextGen Airportal, Phase I

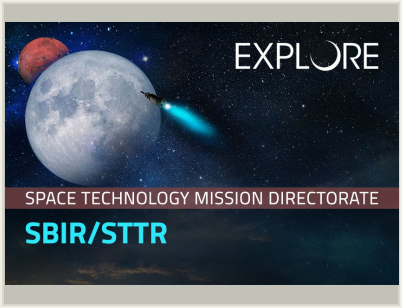
Completed Technology Project (2010 - 2010)

Project Introduction

MassTech, Inc. proposes to develop a Lidar Wind Profiler for standoff sensing of concurrent 3-component wind velocities using an eye-safe, rugged, reliable optical device. We propose to use a multi-beam lidar system to obtain aerosol backscatter data from the flowfield and to develop a time-lag cross-correlation algorithm to extract three-component velocity measurements. In addition, we propose to determine the feasibility of measuring atmospheric turbulence, cloud ceiling as well as the location and intensity of aircraft wake vortices from the lidar backscatter data, in combination with the derived wind data products. In Phase I, a breadboard prototype will be designed and built to demonstrate proof-of-concept of obtaining velocity measurements from a representative flowfield and the results will be validated using sonic and cup-and-vane anemometers. This breadboard will be used to benchmark the system requirements for the design of an ALV prototype that will be built in Phase II and tested in an experimental test facility such as a wind tunnel. These measurements will be validated by comparing with anemometers and existing test data, along with computational predictions. Key design goals are reliability, eye-safety, portability and low cost.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Masstech, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB), Minority-Owned Business	Columbia, Maryland
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Maryland	Virginia

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139954)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Masstech, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

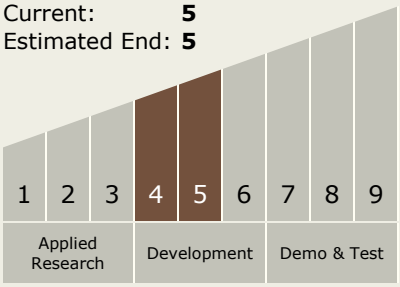
Carlos Torrez

Principal Investigator:

Anand Radhakrishnan

Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System